

Claims

- 1 1. A fuel supply system for a reciprocating engine, the combination comprising:
 - 2 a fuel injector for receiving fuel from a source of fuel and delivering fuel
 - 3 to an engine cylinder;
 - 4 a variable volume, positive displacement fuel pump having an inlet for
 - 5 receiving fuel from said source of fuel and an outlet for delivering fuel to said injector,
 - 6 said pump being driven in timed relation to the reciprocation of said engine;
 - 7 a throttle valve rotatable to control the volume of air to said engine
 - 8 cylinder and having positions proportional to speed and load on said engine; and
 - 9 control means responsive to the position of said throttle valve to control
 - 10 the displacement of said pump to said fuel injector for each intake stroke of said engine in
 - 11 proportion to speed and load on said engine.
- 1 2. A fuel supply system according to claim 1 in which said pump includes a
2 reciprocating piston means and a pivoting cam to engage said piston means to regulate
3 the length of stroke of said piston means.
- 1 3. A fuel supply system of claim 1 wherein the stroke of said piston means of
2 said pump is at a maximum stroke when said engine is operating at maximum speed and
3 at a minimum stroke when said engine is operating at minimum speed.
- 1 4. A fuel supply system of claim 1 and further comprising a nozzle receiving fuel
2 from said pump and having an outlet passage delivering a pre-determined quantity of fuel
3 delivered at a positive pressure for each delivery stroke of said pump.

1 5. The fuel supply system of claim 1 wherein control means includes a
2 mechanical connection between a cam and said throttle valve for movement of said cam
3 in response to movement of said throttle valve.

1 6. The fuel supply system of claim 5 wherein said mechanical connection is a
2 link.

1 7. The fuel supply system of claim 6 wherein said mechanical link is provided
2 with a resilient member to dampen vibrations and minor movements of said throttle
3 valve.

1 8. A fuel supply system for a reciprocating engine, the combination comprising:

2 a fuel reservoir;

3 a mixing chamber for receiving air and fuel;

4 a nozzle positioned to deliver fuel to said mixing chamber;

5 a pump having a piston reciprocating in response to hydraulic pressure,
6 said pump having an inlet for receiving fuel from said reservoir and an outlet for
7 delivering fuel to said nozzle;

8 a hydraulic actuator moveable in timed relationship to the reciprocation of
9 said engine;

10 conduit means connecting said pump and hydraulic actuator, said pump
11 being operable to deliver hydraulic fluid to said pump to reciprocate said piston;

12 a programmable cam engageable with said piston to regulate the length of
13 its reciprocating stroke between a minimum stroke and a maximum stroke;

14 a throttle valve in said mixing chamber to said engine moveable to control
15 the amount of air and fuel delivered from said mixing chamber; and

16 linkage means connected to said throttle and to said cam for moving said
17 cam in response to movement of said throttle to vary the stroke of said piston and
18 displacement of said pump in proportion to the engine speed and load.

1 9. The fuel supply system of claim 8 wherein said cam is a pivoting cam
2 engageable with one end of said piston to limit its stroke.

1 10. The fuel supply system of claim 8 wherein the position of said programmable
2 cam is in response to the position of said throttle to determine the displacement of said
3 pump between its minimum and maximum strokes.

1 11. The fuel supply system of claim 8 wherein said programmable cam is shaped
2 to determine the positions of the piston and output of said pump high and low speeds of
3 said engine.

1 12. The fuel supply system of claim 8 wherein said linkage means is provided
2 with a resilient member between said throttle and said valve to absorb dampen vibrations.

1 13. The fuel supply system of claim 9 wherein said programmable cam is
2 mounted on a shaft and said cam is adjustable relative to said shaft to accommodate
3 different activities of the environment in which the engine operates.

1 14. The fuel supply system of claim 8 wherein the actuator is reciprocated in
2 response to a valve cam of said engine.

1 15. The fuel supply system of claim 8 wherein said mixing chamber has an axial
2 air passage and forms an annular groove disposed at an angle to the axis of said passage
3 for spinning the air and fuel moving in said passage to maintain fuel movement in one
4 direction in said passage.